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GREAT BRITAIN

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# PATENT SPECIFICATION



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EXAMINER'S

COPY

DIV. 7

518,612

## PROVISIONAL SPECIFICATION

### Process for the Manufacture of Combined Picture and Sound Films

I, Dr. BELA GASPÁR, a Subject of the King of Roumania, of 77/79, Rue Berkendael, Brussels-Forest, Belgium, do hereby declare the nature of this invention to be as follows:—

The present invention relates to a process for the manufacture of a combined picture and sound film in which the picture part is a multi-colour image and in which the sound part consists of a metallic silver sound track on a coloured or uncoloured background. According to the present invention those combined picture and sound films already known as such can be manufactured in a special manner adapted to particular requirements in practice.

In the manufacture of advertising films it is customary to manufacture for the businessmen of a special branch who live at different places such advertising films whose picture part shows the identically same plot in the form of a coloured cinematographic picture strip and which differ only in the accompanying text prepared especially for each individual case. For the economical production, it is very advantageous if such films can be manufactured in a larger series in reserve during times of a reduction in the normal amount of work, these films being provided with the desired text which is subsequently added. Also in those cases in which some copies must be provided with a subsequently synchronised form in a foreign language it is desirable to manufacture the picture strips necessary for the copies in foreign language directly following the production of the large series of the actual film, even if the synchronising is not finished and thus the completion of the copies is still impossible. Finally, it lies in the interest of a simplified processing to possess some finished picture strips in reserve, which, in case of a sudden need can be provided with the one or the other language text. The invention fulfils these and similar requirements. The invention consists therein that in the picture part of the film the part images necessary for the production of the multi-colour image are printed, and thereafter transformed into dyestuff images and that

on the other hand, the sound strip, i.e., that part of the film into which the sound track is to be printed, is completely blackened by means of a uniform exposure and development so that after the completion of the picture part the film consists of a multi-colour image and an equally black strip of metallic silver in the field of the sound track which is to be later recorded. For this purpose the uniformly black strip of metallic silver is transformed into a light sensitive salt and the light sensitive strip thus obtained is used for printing the sound track, thereby (after exposure and fixing) yielding the black sound track. This invention described above in its fundamental form can be carried out in many different ways these procedures varying according to the method used for the production of the dyestuff image. Several of these procedures are described in the following.

#### EXAMPLE 1.

Production of the multi-colour image by local destruction of the dyestuffs. A three layer film with pre-dyed layers differently sensitised according to British Patent 415,040 is used which is coated on both sides and which carries blue-sensitive layers as the top and rear layers and a yellow-dyed red-sensitive layer as the middle layer. The part colour images are printed from positive master images into the different layers, i.e., the red extract with blue light into the blue-green layer, the green extract with blue light into the magenta layer and the blue extract with red light into the yellow layer. Furthermore the sound strip part of the film is uniformly exposed to red or blue light, the choice of light depending on whether the sound track is later to be produced on a coloured or a colourless background. The entire film is thereupon treated with a dyestuff destroying bath which effects the local destruction of the dyestuff at the exposed places and which, as for example, 5% hydrogen bromide, does not dissolve or at most only partly dissolves the silver and which forms at the places of the silver a silver salt insoluble in the treatment bath. The silver precipitate within the range of the

[Price 1/-]

sound track participates in this reaction and effects decolouration of the strip designated for the sound track. If a decolouration of the strip is to be effected, all three layers are exposed; if, for example, only the blue green colour is to be destroyed so that the yellow and the magenta dye remain and finally a black sound track is obtained, only the blue green side of the film is exposed. After the dye destroying treatment the metallic silver or the silver salt, if any is formed, is dissolved out in the picture part of the film, but not in the sound track part of the film. The silver salt formed in this part is, on the contrary, re-converted into metallic silver before the film is fixed. After the fixing the film shows the finished multi-colour image in the picture part and a uniform blackening. In this state the film can be examined in the usual manner and can be stored in any way without any special precautions being necessary before the sound track is printed onto it. Before the printing of the sound track the film is lead through a bath which converts the metallic silver into light sensitive salt and thereafter it is exposed through the sound master image, developed and fixed.

The process described in the above example explains the method for a case in which the exposure effects colourlessness at the exposed places. The following serves as an example for a process in which the exposure has the effect that the exposed places appear coloured in the finished film.

**EXAMPLE 2.**

The sound film is formed on a three layer film whose layers contain components for colour development in the known manner. If in this case all three layers are equally blackened within the range of the sound track and are equally treated as in the picture part dyestuffs are then formed in all three layers during the colour development. In this case the components must be chosen in such a way that the dyestuffs formed are transparent for dark red or infrared light. If a black sound track on a red background is to be formed, then in this case only those two layers are exposed within the range of the sound track which develop in magenta and in yellow colour. Moreover, the usual colour development

is performed with the only difference that the metallic silver developed at the same time as the dyestuff is not removed by means of the usual Farmer's reducer but is transformed beforehand throughout the entire film into silver chloride by treatment with a neutral copper chloride solution or (by treatment with other suitable solutions) into another silver salt which can be fixed out. The silver salt in the strip for the production of the sound track is re-converted into black silver by developers, fogging agents, or reducers before the film is fixed. The film can be stored until the sound track is to be printed therein. The printing of the sound track is performed as described in example 1.

If a layer of a multi-layer film which does not lie at the surface is exposed uniformly in the range of the sound track and if this layer is thereby reserved for the subsequent sound recording, the sound track does not lie at the surface and is protected against mechanical influences of any sort.

If further recordings, as for example, subtitles or intermediate titles which are to be only subsequently printed in are to be united with the picture part then these recordings can be printed black onto a white or coloured background in the same manner by uniformly exposing the corresponding image field parts. In this case the coloured background can also be provided with samples, if for example, in two of the three coloured layers dyestuff images are produced during the image formation and only the third layer is uniformly blackened and reserved for the subsequent printing in of the titles.

After the silver deposit of the sound track is reconverted into a silver halide it can either at the same time with the re-conversion or, subsequently, be treated with the solution of a colour or chemical sensitiser, for example, with a solution of 0.1 g. benzothiopseudocyanine ethyl iodide in 1 litre of water.

Dated this 27th day of July, 1938.

LESLIE N. COX,  
Patent Agent,  
408/9, Bank Chambers,  
29, Southampton Buildings,  
London, W.C.2.  
Agent for the Applicant.

## COMPLETE SPECIFICATION

### Process for the Manufacture of Combined Picture and Sound Films

I, Dr. BELA GASPAR, a Subject of the King of Roumania, of 77/79, Rue

Berkendael, Brussels-Forest, Belgium, do hereby declare the nature of this inven-

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tion and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- 5 The present invention relates to a process for the manufacture of a combined picture and sound film in which the picture part is a multicolour image and in which the sound part consists of a  
10 metallic silver sound track on a coloured or uncoloured background. According to the present invention those combined picture and sound films already known as such can be manufactured in a special manner adapted to particular requirements in practice.
- 15 In the manufacture of advertising films it is customary to manufacture for the businessmen of a special branch who live at different places such advertising films whose picture part shows the identically same plot in the form of a coloured cinematographic picture strip and which differ only in the accompanying text  
20 prepared especially for each individual case. For the economical production, it is very advantageous if such films can be manufactured in a larger series in reserve during times of a reduction in the normal amount of work, these films being provided with the desired text which is subsequently added. Also in those cases in which some copies must be provided with a subsequently synchronised form in a foreign language it is desirable to manufacture the picture strips necessary for the copies in foreign language directly following the production of the large series of the actual film, even if the  
40 synchronising is not finished and thus the completion of the copies is still impossible. Finally, it lies in the interest of a simplified processing to possess some finished picture strips in reserve which, in case of a sudden need can be provided with the one or the other language text. The invention fulfils these and similar requirements. The invention consists therein that in the picture part of the film the part images necessary for the production of the multicolour image are printed and thereafter transformed into dye images and that on the other hand, the sound strip, i.e. that  
55 part of the film into which the sound track is to be printed, is completely blackened by means of a uniform exposure and development so that after the completion of the picture part the film consists of a multicolour image and an equally black strip of metallic silver in the field of the sound track which is to be later recorded. For this purpose the uniformly black strip of metallic  
65 silver is transformed into a light-sensitive

salt and the light-sensitive strip thus obtained is used for printing the sound track, thereby (after exposure and fixing) yielding the black sound track. This invention described above in its fundamental form can be carried out in many different ways these procedures varying according to the method used for the production of the dye image. Several of these procedures are described in the following.

#### EXAMPLE 1.

Production of the multicolour image by local dye destruction. A three layer film with predyed layers differently sensitized according to British Patent Specification No. 415,040 is used which is coated on both sides and which carries blue-sensitive layers as the top and rear layers and a yellow-dyed red-sensitive layer as the middle layer. The part colour images are printed from positive master images into the different layers, i.e. the red extract with blue light into the blue-green layer, the green extract with blue light into the magenta layer and the blue extract with red light into the yellow layer. Furthermore, the sound strip part of the film is uniformly exposed to red or blue light, the choice of light depending on whether the sound track is later to be produced on a coloured or a colourless background. The entire film is thereupon treated with a dye-destroying bath which effects the local dye destruction at the exposed places and which, as for example, 5% hydrogen bromide does not dissolve or at most only partly dissolve the silver and which forms at the places of the silver salt insoluble in the treatment bath. The silver precipitate within the range of the sound track participates in this reaction and effects decolouration of the strip designated for the sound track. If a decolouration of the strip is to be effected, all three layers are exposed; or if, for example, only the blue-green colour is to be destroyed so that the yellow and the magenta dye remain and finally a black and red sound track is obtained, only the blue-green side of the film is exposed. After the dye-destroying treatment the metallic silver or the silver salt, if any is formed, is dissolved out in the picture part of the film, but not in the sound track part of the film. The silver salt formed in this part is, on the contrary, reconverted into metallic silver before the film is fixed. After the fixing the film shows the finished multicolour image in the picture part and a uniform blackening of the sound area. In this state the film can be examined in the usual manner and can be stored in any

way without any special precautions being necessary before the sound track is printed onto it. Before the printing of the sound track the film is led through a bath which converts the metallic silver into light-sensitive salt and thereafter it is exposed through the sound master image, developed and fixed.

The process described in the above Example explains the method for a case in which the exposure effects colourlessness at the exposed places. The following serves as an example for a process in which the exposure has the effect that the exposed places appear coloured in the finished film.

#### EXAMPLE 2.

The sound film is formed on a three-layer-film whose layers contain components for colour development in the known manner. If in this case all three layers are equally blackened within the range of the sound track and are equally treated as in the picture part, dyes are then formed in all three layers during the colour development. In this case the components must be chosen in such a way that the dyes formed are transparent for dark red or infra-red light. If a black sound track on a red background is to be formed, then in this case only those two layers are exposed within the range of the sound track which develop in magenta and in yellow colour. Moreover, the usual colour development is performed with the only difference that the metallic silver developed at the same time as the dye is not removed by means of the usual Farmer's reducer but is transformed beforehand throughout the entire film into silver chloride by treatment with a neutral copper chloride solution or (by treatment with other suitable solutions) into another silver salt which can be fixed out. The silver salt in the strip for the production of the sound track is re-converted into black silver by developers, fogging agents, or reducers before the film is fixed. The film can be stored until the sound track is to be printed therein. The printing of the sound track is performed as described in Example 1.

If a layer of a multilayer film which does not lie at the surface is exposed uniformly in the range of the sound track and if this layer is thereby reserved for the subsequent sound recording, the sound track does not lie at the surface and is protected against mechanical influences of any sort.

After the silver deposit of the sound track is reconverted into a silver halide it can either at the same time with the re-conversion or, subsequently, be treated

with the solution of a colour or chemical sensitizer, for example, with a solution of 0.1 gram benzothio-pseudocyanine ethyl iodide in 1 litre of water.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The process for producing a kinematographic film having a picture area and a series of kinematographic pictures therein and a sound area and a sound record therein, which comprises printing the pictures into the picture area of the silver halide emulsion layer of said film and illuminating uniformly the sound area, developing the picture area and the sound area of said film to form picture records in the picture area and to form a uniform silver deposit covering the sound area, fixing the film, re-converting the metallic silver within the sound area into a light-sensitive silver salt, printing the sound record into the sound area, developing and fixing the film.

2. The process for producing a kinematographic film having a picture area and a series of multicolour pictures therein and a sound area and a sound record therein, which comprises printing the colour separation records of the multicolour pictures into the picture area of the silver halide emulsion of said film and illuminating uniformly the sound area, developing the picture area and the sound area of said film and converting the colour separation records in the picture area into a multicolour image, re-converting the metallic silver within the sound area into a light-sensitive silver salt, printing the sound record into the sound area, developing and fixing the film.

3. The process for producing a kinematographic film having a picture area and a series of multicolour pictures therein and a sound area and a sound record therein, which comprises printing the colour separation records of the multicolour pictures into the picture area of the silver halide emulsion layer of said film and illuminating uniformly the sound area, developing the picture area and the sound area of said film and converting the colour separation records in the picture area into a multicolour image, converting the metallic silver in both the picture area and the sound area into a soluble silver salt, re-converting said silver salt in the sound area to metallic silver, dissolving the silver salt from the film, re-converting the metallic silver within the sound area into a light-sensitive silver salt, printing the sound record

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into the sound area and developing and  
fixing the film.

4. The process for producing a kine-  
matographic film having a picture area  
5 and a series of multicolour pictures  
therein and a sound area and a sound  
record therein, which comprises printing  
the colour separation records of the multi-  
colour pictures in superposition into the  
10 corresponding silver halide emulsion  
layers of a multilayer film having  
differently colour-sensitized superimposed  
light-sensitive layers, illuminating uni-  
formly the sound area of at least one of  
15 said differently colour-sensitized layers,  
developing the picture area and the sound  
area of said film and converting the  
colour separation records in the picture  
area into a multicolour image, reconvert-  
20 ing the metallic silver within the sound  
area into a light-sensitive silver salt,  
printing the sound record into the sound

area, developing and fixing the film.

5. The process of producing a combined  
multicolour picture and sound film from 25  
a multicolour picture film which has a  
series of multicolour pictures in the  
picture area and a silver deposit of uni-  
form density within the sound area of  
said film, which comprises converting said 30  
metallic silver within the sound area into  
a light-sensitive silver salt without  
affecting said multicolour pictures print-  
ing the sound record into the sound area,  
developing the sound record and fixing 35  
the film.

Dated this 11th day of July, 1939.

LESLIE N. COX.

Patent Agent,  
408/9, Bank Chambers,  
29, Southampton Buildings,  
London, W.C.2.  
Agent for the Applicant.

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